Instrumentation and Control Facility

Purpose:

To research, design, plan, coordinate, and direct the application of components and subsystems for Flight Instrumentation Systems.

Inertial Navigation Sensors Development and Test Laboratories

The Inertial Navigation Sensors Development and Test Laboratories provide the capability to analyze and evaluate inertial sensors and strapdown inertial navigation systems. These facilities consist of three precision rate tables, recording instrumentation, and supporting test equipment. The rate tables are mounted on massive concrete pads designed to decouple the facility from building vibrations and to minimize ambient seismic noise. The rate tables provide precise information about rotation axes that can be tilted parallel to the earth's spin axis to remove the effects of the earth's spin. These tables are used to evaluate rate sensors for bias, scale factor, scale factor linearity, bias stability, and other performance characteristics. These rate tables have been used to support many programs in the past including Solid Rocket Boosters (SRB), Transfer Orbit Stage (TOS), Astro, Avionics Flight Experiment (AFE), etc. Current plans are to use the tables in support of NASA-led activities in the Flight Mechanics area of the Second Generation Reusable Launch Vehicle (RLV) program. The tables are located in Building 4487.

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Navigation Components Development Laboratory

This laboratory provides the capability to develop and evaluate navigation components for launch vehicles. The facility consists of a three-axis rate simulator, a high-fidelity Global Positioning System (GPS) simulator, a rooftop GPS antenna, a GPS base station, a 6-processor simulation computer, workstations, and a data display computer. The facility allows the development of Kalman filters that blend the outputs of inertial measurements systems and GPS receivers for the precise navigation of launch vehicles. This lab will provide a unique capability to rapidly prototype and test blending filters using a variety of inertial measurement units and GPS receivers with various trajectories. The laboratory is presently used in a NASA-led Gen II study called Robust Integrated Technology and Testbed for Navigation of RLVs. It will also support the Low-Cost Avionics for RLVs study which is a joint MSFC AMCOM venture. The facility is located in Building 4487.

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